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# ENTOMOLOGICAL NEWS

**DECEMBER 1955**

**Vol. LXVI** **No. 10**

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**PUBLISHED MONTHLY, EXCEPT AUGUST AND SEPTEMBER, BY**

**THE AMERICAN ENTOMOLOGICAL SOCIETY**

**PRINCE AND LEMON STS., LANCASTER, PA.**

**AND**

**1900 RACE STREET, PHILADELPHIA 3, PA.**

Subscription, per yearly volume of ten numbers: $5.00 domestic; $5.30 foreign; $5.15 Canada. Entered as second-class matter April 19, 1943, at the post office at Lancaster, Pa., under the Act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for in paragraphs (d-2), Section 34.40, P. L. & R. of 1948, authorized April 19, 1943.

# ENTOMOLOGICAL NEWS

**ENTOMOLOGICAL NEWS** is published monthly, excepting August and September, by The American Entomological Society at Prince and Lemon Sts., Lancaster, Pa., and the Academy of Natural Sciences, 1900 Race Street, Philadelphia 3, Pa., U. S. A.

PHILIP P. CALVERT, Editor Emeritus. R. G. SCHMIEDER, Editor. Editorial Staff: H. J. Grant, Jr., E. J. F. MARX, M. E. PHILLIPS, and J. A. G. REHN.

Subscription price, per yearly volume of 10 numbers: Domestic, $5.00; Foreign, $5.30; Canada, $5.15—U. S. Currency.

**SUBSCRIPTIONS:** Communications and remittances to be addressed to **Entomological News, 1900 Race Street, Philadelphia 3, Pa.**

**ADVERTISEMENTS:** Rate schedules available on request. Address, **Fred B. Jacobson, Advertising Manager, Entomological News, 1900 Race Street, Philadelphia 3, Pa.**

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# ENTOMOLOGICAL NEWS

VOL. LXVI DECEMBER, 1955 No. 10

## Occurrence and Description of an Embryonic Egg Burster in the Genus Hexagenia (Ephemeroptera) *

By F. EARLE LYMAN, Southern Illinois University, Carbondale

Although the occurrence of embryonic egg bursters has been reported for a number of insect groups, such a structure has not been recorded previously for mayfly species of the genus *Hexagenia*. An egg burster in the form of a sclerotized knife-like blade (fig. 1) is used by the mature embryos of *Hexagenia limbata, H. rigida,* and *H. affiliata* for cutting an incision in the chorion, thus initiating the rent in the egg shell through which the nymph emerges. No interspecific differences in either the form or size of the egg burster were noted in those species of *Hexagenia* studied. This small egg burster, 45–48 microns in length, is a sclerotized portion of the pronymphal membrane or embryonic cuticle covering the dorsum of the head. It is located immediately anterior to the median ocellus of the mature embryo.

Just prior to emergence the embryo moves the head slowly backward and forward in an antero-posterior direction at intervals of approximately one second and at the same time forces the knife edge of the blade against the inner wall of the chorion. After a small slit is cut through one side of the egg shell near the cephalic end, further force exerted by the emerging nymph is evidently sufficient to rend an opening large enough for com-

* Acknowledgments: This work was aided by funds granted from the General Research Fund, Southern Illinois University, and was done in part as a Research Associate of the Franz Theodore Stone Institute of Hydrobiology, The Ohio State University.

plete emergence. This opening extends across the rounded anterior end and along one side for about two thirds of the length of the egg. Little variation in the size of the fissure was observed. Hunt (1953) has presented some excellent microphotographs of hatched eggs of *H. limbata* which show the form and extent of this fissure. Simultaneously with hatching most of the pronymphal cuticle is shed within the chorion. However, that portion covering the head to which the egg burster is attached may usually be found outside of the shell near the edge of the opening because the head, being pushed out first, often carries the sloughed head cuticle along with it to the outside of the egg shell. Although numerous newly-hatched nymphs were examined, none was found with the egg burster still fastened to the head. All evidence indicates that it is always shed along with the rest of the embryonic cuticle at the time of hatching and therefore it is not found on first instar nymphs.

As seen from dorsal view (fig. 1A), the basal lateral portion of the egg burster is broadest near the posterior end. The razor-sharp knife edge is smooth throughout its entire length and bears no indication of serrations. This cutting edge is slightly curved when seen in lateral view (fig. 1B) so that it conforms closely to the curvature of the internal chorionic surface. Extending laterally in a bilaterally paired arrangement from the basal portion of the egg burster are irregularly spaced, prong-like projections that seem to function both for anchoring the egg burster to the non-sclerotized pronymphal membrane and for increasing the amount of surface area in order to hold the knife firmly in position during the cutting process. The largest and broadest pair of these lateral projections is found near the posterior end. Anteriorly the embryonic cuticle of the head is attached over the frontal process of the embryonic nymphs and blunt tubercles occur on that portion covering the edge of the frontal process.

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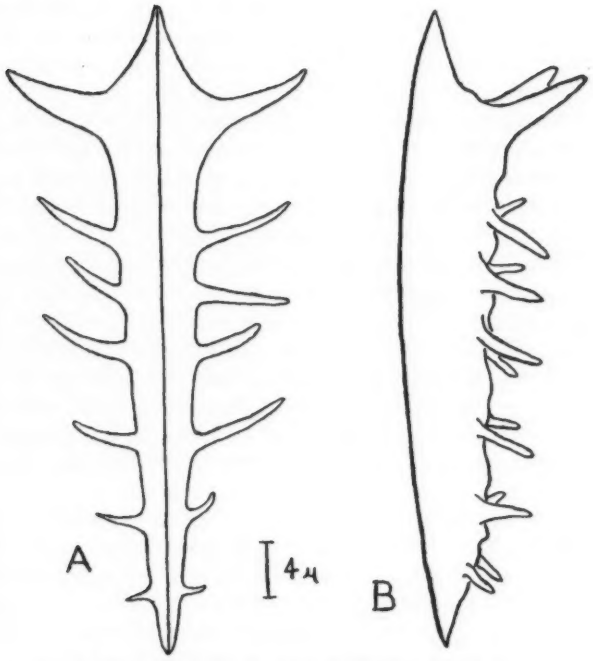


FIG. 1. Egg burster of mature *Hexagenia* embryo.
A. Dorsal view. B. Left lateral view

## A Collection of Stoneflies (Plecoptera) from the Northwest Territories, Canada

By W. E. RICKER, Fisheries Research Board of Canada, Nanaimo, B. C. and W. W. JUDD, Department of Zoology, University of Western Ontario, London, Ontario

In 1954, Mr. P. M. Mann presented to the Department of Zoology, University of Western Ontario a collection of insects

taken by himself in the vicinity of Fort Simpson, Northwest Territories, during the course of biological studies in 1953. Among the specimens collected were twenty-one stoneflies, an account of which is presented herewith.

**Pteronarcys dorsata** Say—2♀♀, June 15–24, 1953, along the lower 52 miles of the Keele River before its confluence with the Mackenzie River. This transcontinental species is found practically everywhere in Canada except for most of British Columbia and the high Arctic (Ricker, 1952).

**Isoperla decolorata** Walker—5♂♂, 5♀♀, June 26, 1953, on bank of Mackenzie River, opposite mouth of Keele River. This species has been reported from several northern localities, including Alaska and the Mackenzie District (Ricker, 1944).

**Isogenus frontalis,** presumably subspecies *colubrinus* Hagen —1♀, June 26, 1953, on bank of Mackenzie River, opposite mouth of Keele River. Ricker (1952) records this subspecies from Manitoba to Alaska, but a female is identifiable only to species.

**Isogenus zionensis** Hanson—4♂♂, 4♀♀, June 26, on bank of Mackenzie River, opposite mouth of Keele River. The only published record of this species is the type series, taken in Zion National Park, southern Utah (Hanson, 1949). Dr. J. F. Hanson has confirmed the identification of a specimen. The females, previously unknown, are as yet undistinguishable from those of the related *Isogenus elongatus*. Consequently the Alberta and Manitoba records of *elongatus* (Ricker, 1947, 1952), being based on females only, might equally apply to this species.

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RICKER, W. E. 1952. Indiana Univ. Publ., Sci. Ser. No. 18, 200 pp.

# A Checklist of the Chilopoda Known to Occur in Kentucky

By Ralph E. Crabill, Jr., Department of Biology,
Saint Louis University

The rather recent acquisition of some instructive Kentucky material, collected largely by Theodore J. Spilman of the United States National Museum, has made the present summary of that state's known chilopod fauna timely. Previously published accounts were surprisingly scant and were based upon scattered localities mentioned in a variety of publications, so that something approaching a unified faunistic picture was difficult to visualize. The present preliminary checklist should facilitate our seeing at least the vague outlines of a broader overview. I hope too it will encourage further collecting in an area that, though still poorly known, promises to contribute considerably to our understanding of North American centipede distribution.

Of particular interest are the records from eastern and southeastern Kentucky whose Cumberland Plateau and Mountains reputedly represent one of the oldest little-altered of North American habitats. In this connection it is probably significant that the genus *Zygethopolys,* known by only three species, has been shown to be represented only in Alaska, in the northwestern United States, and in southeastern Kentucky, where a new and distinctive species, *atrox,* recently was discovered quite unexpectedly in Whitley County.

The form of presentation involves first the citation of the species followed occasionally by reference to additional remarks in an appendix at the end of the article. The locality citations are of two sorts: 1) those which have already appeared in the literature,[1] identified by a bibliographic reference number; 2)

[1] Published statements of broad, summarized distributions that only indirectly include Kentucky are not given. Particularly the older summary-distributions too often amount only to partial speculations wherein one assumes—but does not know—that a species inhabits Y if it has been shown to occur in X and Z. Such summaries very often can have a dis-

those based upon specimens which I have studied but have not yet reported on, identified by the initials of the collector.

I should like to express my gratitude to the collectors named below for their generosity in making this valuable material available to me: George E. Ball (GEB); Barry D. Valentine (BDV); Richard L. Hoffman (RLH); Theodore J. Spilman (TJS); and Edward O. Wilson (EOW). The initials (REC) identify specimens collected by me, and (MCZ) follows citations based upon specimens that I have examined in the Museum of Comparative Zoology at Harvard.

### GEOPHILOMORPHA

#### Geophilidae

*Geophilus ampyx* Crabill [olim *mordax* Meinert, in part., see 12, p. 183]. Near Irvine (RLH); Louisville, Prospect, Jefferson County Forest, Cumberland Falls State Park, Campbellsville, near Pine Ridge, Black Mountain (Harlan Co.) (TJS).

*G. varians* McNeill. Louisville (13).

*G. vittatus* (Rafinesque) [olim *rubens* Say]. Louisville (13).

*Brachygeophilus parki* Auerbach. Louisville (TJS).

*Arenophilus bipuncticeps* (Wood). Louisville (TJS).

*A. watsingus* Chamberlin. Fulton, Lexington (4).

*Arctogeophilus umbraticus* (McNeill). Fulton, Lexington (4); near Pine Ridge, Louisville, Cumberland Falls State Park (TJS).

#### Dignathodontidae

*Strigamia branneri* (Bollman). Fulton (4).

*S. bothriopa* Wood. (See appendix). Louisville (14).

*S. bidens* Wood. Lexington (4); near Irvine (RLH).

*S. chionophila* Wood. Lexington (4); Mammoth Cave (2); Louisville (TJS).

*S. fulva* Sager. (See appendix). Fulton (4).

tinct, broad analytical value, but one should bear in mind—especially when working with summary-distributions of lesser known groups published in the last century—that they are theories based frequently upon very fragmentary evidence.

Himantariidae

*Gosiphilus euphorion* Crabill. Near Livingston, Cumberland National Forest (12).

SCOLOPENDROMORPHA

Scolopendridae

*Scolopendra heros* Girard. Mammoth Cave (1, 16, 9); Kentucky [sic] (18).

*Cormocephalus* (*Hemiscolopendra*) *punctiventris* (Newport). Louisville, Jefferson County Forest, Campbellsville, near Livingston, Cumberland Falls State Park, near Pine Ridge (TJS); Jessamine Co. (GEB, BDV).

Cryptopidae

*Cryptops hyaline* Say. (See appendix). Bee Spring (1, 16); Kentucky [sic] (18); Louisville, Prospect, Campbellsville, Cumberland Falls State Park, near Pine Ridge (TJS).

*Theatops postica* (Say). Bee Spring (1, 16); Kentucky [sic] (1, 16, 18); Louisville, Campbellsville, Cumberland Falls State Park, near Livingston, near Pine Ridge (TJS); near Irvine (RLH); Jessamine Co. (GEB).

*Scolopocryptops sexspinosa* (Say) [olim *Otocryptops*]. Kentucky [sic] (1, 16, 18); near Campbellsville, Prospect, Louisville (TJS); Fort Knox (EOW); Lexington (REC, MCZ); Jessamine Co. (GEB).

*S. nigridia* McNeill. Magoffin Co. (10); near Irvine (RLH); Louisville, Jefferson County Forest, Cumberland Falls State Park, Salyersville (TJS).

Species Inquirenda

*Mycotheres leucopoda* Rafinesque. (See appendix). Knobs of Kentucky (15, 17).

LITHOBIOMORPHA

Ethopolyinae

*Bothropolys multidentatus* (Newport). Near Mammoth Cave (7, 16); Greensburg (7); Osceola [in Kentucky ?] (7);

Campbellsville, Louisville, Jefferson County Forest, Prospect, Salyersville, near Pine Ridge, Cumberland Falls State Park, Black Mountain (Harlan Co.) (TJS).

*Zygethopolys atrox* Crabill. Cumberland Falls State Park (11).

Lithobiinae

*Lithobius forficatus* (Linné). Fulton (3); Lexington (3, 8, REC); Bee Spring, Covington (8); Louisville (TJS).

*L. celer* Bollman. Fulton (3).

*Garibius opicolens* Chamberlin, [? *G. pagoketes* = *opicolens*]. Cumberland Falls State Park, Prospect Campbellsville (TJS).

*Nadabius iowensis* (Meinert). Louisville (TJS).

*N. pullus* (Bollman). Salyersville (TJS).

*Nampabius michiganensis* Chamberlin. Louisville (TJS).

*Pokabius bilabiatus* (Wood). Louisville (TJS).

*Sonibius numius* (Chamberlin). Louisville (TJS).

*S. politus* (McNeill). Jefferson County Forest (TJS).

*Sozibius proridens* (Bollman) [*providens*, sensu Chamberlin]. Jefferson County Forest, Louisville (TJS).

*S. tuobukus* (Chamberlin). Lexington (3, 6); Louisville (TJS).

*Tidabius tivius* (Chamberlin). Lexington (5).

*Paitobius exiguus* (Meinert) [species inquirenda]. Lexington (3).

*P. naiwatus* (Chamberlin). Lexington (3).

Appendix

*Strigamia bothriopa* Wood. The long history of this valid binomen has recently been discussed in some detail (14). The reader should be warned that many of the published locality records attributed to *Strigamia fulva* Sager (olim, *Linotaenia fulva*) actually were probably based upon specimens of the Wood species. Inasmuch as the true *fulva* has been found to be exceedingly rare in well-collected up-state New York localities and is entirely unknown west of central New York State,

it seems likely that Chamberlin's citation of a Kentucky *fulva* was really based upon specimens of *bothriopa*.

*Cryptops hyalina* Say. In the attempt to stabilize our treatment of the gender of those genera ending in *-ops*, I have rendered all inflexive trivial names in the feminine as has been recommended in the "Copenhagen Decisions," p. 51, P. 84, (7) (b) (iii). Heretofore, the scolopendromorph *-ops* genera arbitrarily have been treated as masculine or feminine by many authors, myself included.

*Mycotheres leucopoda* Rafinesque. In 1953 (15) I attempted to show cause for equating *Cryptops hyalina* Say, 1821, with the Rafinesque name of 1820. Admittedly, my reasoning depended to a large extent upon several assumptions that were not even at that time too convincing. Having given the matter considerable thought, and while still recognizing that there is some basis for viewing *leucopoda* as the senior synonym of *hyalina*, I am now of the opinion that we should probably continue to use the Say name until the problem can be resolved on the basis of more evidence than is now apparent.

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# Mecoptera Prefer a Motel

By S. W. Frost and George H. Beatty, The Pennsylvania State University

The presence of numerous Mecoptera about a motel at Kane, Pennsylvania, on July 7th, aroused great interest and presented an unusual problem. We arrived at Kane about five in the afternoon and soon discovered many of these insects on the lawn and bushes about our motel. The owner had noticed them and stated that they even had been seen indoors. She had considered them as pests but, on learning that they are scavengers and do not damage foliage or bite, was somewhat relieved.

The motel was located in a clearing surrounded only by a well-kept lawn and conventional shrubbery. There was a small wood lot about 500 feet distant which later revealed the presence of Mecoptera. At first we thought that these insects were attracted to the neon signs and powerful lights about the motel.* However, none were seen about the lights in the early evening nor even at midnight. Our collection consisted of three species: *Bittacus apicalis* 3♀, *Panorpa canadensis* 3♂, 1♀, and *Panorpa acuta* 1♂, 2♀. We could have taken many more but these seemed to represent all the species present.

Strangely, the specimens were collected without a net. They seemed to be very inactive and were easily picked up with the fingers. The owner assured us that no D.D.T. or similar poisons had been used upon the lawn or bushes and they could not have been affected in this way. We are still at loss to know what they were doing in such numbers under these circumstances.

*We have on various occasions taken Mecoptera at lights which will be discussed in a future paper.

## Notes and News in Entomology

Under this heading we present from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

### Talking Bees

In 1947, ENTOMOLOGICAL NEWS made available to its readers a brief account [1] of the remarkable new advances in the study of the behavior of bees published by Professor KARL VON FRISCH in 1946.[2] These advances initiated, so to speak, von Frisch's second great attack of the problem of the behavior and the language of bees in which he, with the help of his students and associates, has been making a series of new discoveries that have aroused great interest particularly in the highest scientific circles. Some of these discoveries have received notice also in these pages.[3]

The earlier work of von Frisch began about 1912 and included his researches on color vision and on the olfactory sense, and it culminated finally in his 1923 paper in the *Zoologische Jahrbücher* (*Physiol.*) on the language of bees. Unfortunately these researches that gained him recognition as one of the two or three outstanding experimental biologists in Europe were available only to those who could read German. However, then and again in recent years he has received support from the Rockefeller Foundation, and he visited the United States on a lecture tour in 1930. In 1937, *Science Progress* published a lecture by von Frisch that was reprinted in the Smithsonian Annual Report.

The 1946 publication in the Austrian journal was followed by others that appeared in *Die Naturwissenschaften,* and in *Experientia.* Happily, this work found a translator in Dr. Dora Ilse [4] who made complete literal translations for an English

[1] SCHMIEDER, R. G. 1947. ENT. NEWS 58: 152–54.

[2] VON FRISCH, K. 1946. Österr. Zool. Zeitschr. 1: 1–48.

[3] SCHMIEDER, R. G. 1952. ENT. NEWS 63: 100–02. *Ib.* 1953. 64: 262–65. *Ib.* 1954. 65: 256–59.

[4] ILSE, D. British Jour. Animal Behaviour, Vol. 1, No. 4 (1947), and Vol. 1, No. 9 (1951).

journal that is available in some libraries. A condensed account of all the work done was then provided in a small volume [5] based on lectures given at Cornell University. Finally, we are now fortunate enough to have a fine translation,[6] by Dr. Ilse, of von Frisch's popular book on the life of the bee.[7] Although it tells the whole story of the honey bee, this book does emphasize those aspects that were the subject of the author's investigations, that is to say, the optic and olfactory senses and the part they play in the daily activities of the bees, and finally the language of the bees and their ability to communicate detailed information. This book therefore gives us a different and deeper insight into bees than any other bee book. It also takes up briefly the latest development, dealing with how the swarm "makes up its mind," or "votes" on which of several possible nesting sites it will use as its new home.[8] This phenomenon is considered by Professor Haldane [9] to be "the most remarkable achievement of animal communication so far known to man." Dr. Ilse's translation is very fine; it is quite literal, and preserves the style of the original, concise yet lucid and interesting.

**Bees' Sense of Time.** This past season has brought forth several new developments relating to the behavior of bees. As many will have seen in the pages of "Life," [10] an experiment suggested by von Frisch [11] many years ago, and requiring international cooperation, was finally carried through. Bees can be trained to visit a feeding place at a given hour of the day, even when confined to a completely enclosed room that then consti-

[5] VON FRISCH, K. Bees, their vision, chemical senses and language. Pp. 119, ill. Cornell University Press, 1950. Ithaca, N. Y.

[6] VON FRISCH, K. The Dancing Bees. An account of the life and senses of the honey bee. Translated by DORA ILSE. Pp. 183, ill. Harcourt, Brace and Co., New York, 1955. Price $4.00.

[7] VON FRISCH, K. 1953. Aus dem Leben der Bienen, 5th revised edition. Springer Verlag, Berlin-Göttingen-Heidelberg.

[8] See ENT. NEWS 1952, 1953. 63: 100–102, 64: 262–265.

[9] HALDANE, J. B. S. 1955. Animal communication and the origin of human language. Science Progress (London) 53: 385–401.

[10] See *Life* 39 (2): 91–94. (July 11, 1955) Chicago.

[11] For details, see VON FRISCH, The Dancing Bees, pp. 137–147.

tutes their flight space and that is continuously artificially lighted. Von Frisch was not able to say whether the bee depends on a sense of time (a sort of internal clock) to determine that 24 hours have elapsed, or whether it is able to tell the time of day by sensing possible diurnal environmental periodicities. According to *Life,* Dr. MAX RENNER, an associate of von Frisch, brought a hive with bees, trained to feed at a certain hour, from a room at the University of Paris to the American Museum of Natural History in New York by aeroplane. It was set up in an enclosure, duplicating the Paris room, in time for the next feeding period. The results agreed with the "internal clock" theory, for the bees remained on Paris time and did not change to the 6-hour earlier New York time; they kept their 24-hour schedule.

**Do cross winds affect direction giving?** Other new discoveries on the behavior of bees were reported by von Frisch and Lindauer last July.[12] These concern the speed of flight and possible effects of cross-winds on flight directions as imparted to hive-mates.

If a bee, on its way to a feeding place, is exposed to a cross-wind, it will be carried sideways off its line of flight unless it compensates for the effect of the wind. Direct observations showed that the bee does compensate for drift by flying at an angle into the wind much as the pilot of a ferryboat who points his vessel upstream in order to arrive on the opposite shore of a river. This poses the question: Does such a bee upon its return to the hive indicate in its dances the angle with the sun that its body had to assume during the flight or does it indicate the true direction, that is, the direction of flight had there been calm? In order to determine this it was necessary to know precisely the strength and direction of the wind to which the bee is actually exposed, and to this end two anemometers were set up at equal intervals between the hive and the 210 meter distant feeding place. These were set at the height (2½ meters)

[12] VON FRISCH, K. und LINDAUER, M., 1955. Über die Fluggeschwindigkeit der Bienen und über ihre Richtungsweisung bei Seitenwind. Die Naturwissenschaften 42 (13): 377–385.

at which bees regularly fly and they provided to the experimenter at the hive, by electrical transmission, a continuous record of the velocity and the direction of the wind. There still remained to be determined the bees' speed of flight in order to be able to know the exact instant at which the marked experimental bee would pass each of the anemometers.

Determinations on the speed of flight had already been made by O. W. PARK [13] whose findings on speed, and on the effect of head and tail winds, in causing increases and decreases respectively, in the bees' own air speed are confirmed by von Frisch and Lindauer. However, the present figures for flight speeds are more accurate because in these experiments the moment of arrival at the destination was noted rather than the moment that the bee actually alighted, for bees usually circle around a few moments before alighting.

It was found that during calm the speed in going to fetch dilute sugar solutions ($\frac{1}{8}$ molar and $\frac{1}{4}$ molar) is about 22 to 25 km/hr. For stronger, more desirable, solutions (2 molar) bees speed up to about 29 km/hr. (i.e., 18 miles per hour).

Finally, knowing the exact velocity and direction of the wind at the moment of flight, it was now possible to determine the angle at which the bee flew to compensate for drift. Many exact determinations were made for individual flights of numbered bees and compared with the subsequent dances of the same bees in their routine of imparting the information on the direction of the food (as related to the sun's direction) to their hive mates.

It was found that after an outward flight, exposed to a strong cross-wind, the returning bee does not indicate to its hive mates the direction in which it actually had to fly (i.e., the direction or angle that its body had to assume in relation to the sun) in order to reach the food but rather indicates the direction in which it would have flown in the absence of wind! Or, in the words of the authors: "Thus, the dancing bee indicates the same direction to its comrades whether there happens to be a

[13] PARK, O. W. 1923. Amer. Bee Jour. 71; and 1929. Bull. Agr. Expr. Sta. Iowa No. 108.

strong cross-wind or a calm. In both cases she indicates the true direction to the feeding place. . . . But this means that when there is a cross-wind the bee must reduce the angle of the sun that she actually experienced (as a result of having to fly at an angle into the wind) to the angle that she would have seen in a calm. Without doubt, from the point of view of the biologist, this makes sense, since the wind changes from minute to minute and the comrades that respond to the direction giving dance may frequently encounter a different wind velocity than the returning first bee experienced. However, the ability to make this correction constitutes a most amazing accomplishment.

R. G. SCHMIEDER

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## Review

A REVISION OF THE PSYCHODIDAE (DIPTERA) IN AMERICA NORTH OF MEXICO by Larry W. Quate. University of California Publications in Entomology, Volume 10, No. 3, pp. 103–273, 105 text figures. University of California Press. Berkeley, 1955. $2.50.

This excellent revision is long overdue since Haseman's 1907 monograph has been outdated for many years.

Descriptions and discussion of individual species are clearcut and to the point with no excess verbiage. The discussion under "Morphology and Terminology" will be useful to the non-specialist and is adequate to clarify the characters used in the keys.

The line drawings are well done.—L. L. PECHUMAN

# EXCHANGES

**This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.**

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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**Conopidae** of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

**Anisoptera**—Nearctic sp. wanted for exchange, espec. Ophiog., Arigom., Aeschna, Neurocor., Somatoc., Cordulia, Dorocor., Leucor. R. D. Cuyler, Dept. of Entomology, N. C. State College, Raleigh, N. C.

**Bembicini and Stizini** (Hym., Sphec.) of New World wanted for revis. study. Will return upon request or at end of project. James E. Gillaspy, Dept. of Zoology, Univ. Texas, Austin 12, Texas.

**Agapema galbina.** Will exchange cocoons of this moth for nature books. E. Frizzell, Route 4, Box 96, San Benito, Texas.

**Wanted**—Data on exact location of colonies of *Epibembex* (olim *Bembix*) (Hymenoptera), any species, any part of country, for biological studies. Howard E. Evans, Dept. Entomology, Cornell Univ., Ithaca, N. Y.

**Fanniinae** wanted on loan (nearctic and holarctic), and information on collections. James G. Chillcott, Dept. Entom., Univ. of Kansas, Lawrence, Kan. (Loans may be charged to Dr. C. D. Michener.)

**Tenebrionidae** of the World wanted, in exchange for insects of Argentina and neighboring countries. Horacio J. Molinari, Av. Lib. Gral. San Martin 55, Acassuso (Buenos Aires), Rep. Argentina.

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